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Let the sun shine in to produce energy at home
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A few days of rest and relaxation in the Outer Banks sunshine made me think about this week's column on solar energy. Solar energy seems like a doable idea in a place where the sun shines most of the time.

But how about the rest of us who live in areas where long winter months drag on with gray skies or have a lot of cold and snow? How well will solar energy work in less than ideal conditions?

To see a firsthand example of a Maine house that is solar, click on www.solarhouse.com. This house in southern Maine was situated with the help of an architect to get the maximum southerly exposure.

The roof of the house has solar panels with half for heating water and the other half for electric power. The house has been standing since March 1995, and the average monthly utility bill is $12. According to the Web site, "cold weather makes the solar panels more efficient because the house absorbs heat more readily with the sun at a lower angle."

Did you know the sun produces 317 Btu per hour per square foot of Earth, according to the Department of Energy. Pretty amazing what the sun provides. The challenge lies in making that energy available and affordable.

The federal government is playing an active role in getting solar energy into the mainstream. In June 1997, President Clinton announced the Million Solar Roofs Initiative to install solar systems on 1 million roofs nationwide by 2010. The Energy Department's Office of Energy Efficiency and Renewable Energy Network is working with businesses and communities to make this happen.

Olney Elementary School, Maryland's first public school to be solarized under

the Million Solar Roofs Initiative, began operating with solar power on March 27. The Montgomery County school is the first of six to be solarized by the Maryland Energy Administration.

Maryland was the first partner in this novel endeavor. Funding for the project, which cost about $10,000, came from federal and state funds and a partnership with BP-Amoco.

Solar power still seems a bit of a mystery to me. How exactly does it work and how costly is it to install?

To answer these questions, I did some research on the Internet and here's what I learned.

There are three ways of using solar power - passive solar heat, active solar heat and photovoltaics (PV). The first two collect the sun's energy for use in heating and making hot water. PV uses sunlight to generate electricity directly. The light strikes a PV cell that causes a voltage to be created, similar to the energy derived from a battery.

Passive solar heat is generated with a large area of glass facing south. The sun's ray pass through the glass to warm the interior. Active solar power uses thermal collectors, mounted on the roof, to concentrate the sun's heat and transfer it to circulating water. The water is stored in a large tank inside the house that is used for heating and hot water.

The last method - PV - was discovered by French physicist Alexandre Edmond Becquerel in 1839. It was not until 1954, however, that scientists at Bell Labs were able to make PV cells work. And in 1958, PV cells were used to power the radio of the Vanguard satellite.

With today's higher oil prices and the pollution generated by burning fossil fuels, solar energy is being taken more seriously. The federal government, industry and research organizations are investing in research, development and production.

PV cells can convert from 7 percent to 17 percent of sunlight into electricity. PV modules, or cells, cost around $6 per watt and can produce electricity at a cost of about 25 cents to 50 cents per kilowatt hour. A typical residence can be served using a 4 kilowatt PV system. The one drawback of a PV system is that it produces power only when the sun shines, so it is necessary to have a backup generator. And the cost of a complete system can run from $25,000 to $40,000.

To learn more about solar energy, visit the Solar Energy Industry Association's Web site at www.seia.org, the Sustainable Building Industry Council's Web

site at www.sbicouncil.org or the Energy Department's Web site at www.eren.doe.gov.

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